

WHAT IS CLAIMED IS:

1. A sensor comprising:

a metallic housing having a hollow portion;

a metallic terminal pin, a part of which is inserted into the hollow portion of the housing;

a sensing element connected to the terminal pin; and

a resin casing;

wherein the terminal pin and the resin casing provide a connector for connecting an outer circuit outside the sensor,

wherein a part of the resin casing is disposed in the hollow portion, and

wherein the terminal pin and the housing are molded with the resin casing by insert molding so that the resin casing, the terminal pin, and the housing are integrated together.

2. The sensor according to claim 1,

wherein the hollow portion of the housing includes an inner wall having an uneven portion for increasing bonding strength between the resin casing and the housing.

3. The sensor according to claim 2,

wherein the uneven portion has a screw shape.

4. The sensor according to claim 3,

wherein the hollow portion of the housing has a cylindrical shape with a center axis, and

wherein the screw shape of the uneven portion is asymmetric

in relation to the center axis of the hollow portion.

5. The sensor according to claim 2,
wherein the uneven portion has a wrinkle shape.

6. The sensor according to claim 5,
wherein the hollow portion of the housing has a cylindrical
shape with a center axis, and
wherein the wrinkle shape of the uneven portion is asymmetric
in relation to the center axis of the hollow portion.

7. The sensor according to claim 2,
wherein the uneven portion is a groove disposed on an inner
wall of the hollow portion.

8. The sensor according to claim 7,
wherein the hollow portion of the housing has a cylindrical
shape with a center axis, and
wherein the groove is asymmetric in relation to the center
axis of the hollow portion.

9. The sensor according to claim 2,
wherein the uneven portion is a through hole penetrating the
inner wall of the hollow portion.

10. The sensor according to claim 7,
wherein the groove has a resin introduction port for

introducing resin material in a case where the terminal pin and the housing are molded with the resin casing by insert molding.

11. The sensor according to claim 1,

wherein the terminal pin has a hook portion for hooking the terminal pin to the resin casing so that the terminal pin is prevented from being removed from the resin casing in an axial direction of the terminal pin, the hook portion being molded with the resin casing.

12. The sensor according to claim 11,

wherein the hook portion of the terminal pin is a hole penetrating the terminal pin.

13. The sensor according to claim 11,

wherein the hook portion of the terminal pin is provided by the terminal pin having a non-linear shape, which deviates from a center axis of the terminal pin.

14. The sensor according to claim 11,

wherein the hook portion of the terminal pin is provided by the terminal pin having a taper shape, which expands toward one end of the terminal pin.

15. The sensor according to claim 11,

wherein the hook portion of the terminal pin is provided by the terminal pin having a rough surface.

16. A sensor comprising:
a metallic housing having a hollow portion;
a metallic terminal pin for connecting an outer circuit outside the sensor;
a sensing element connected to the terminal pin, for sensing physical quantity; and
a resin casing,
wherein the terminal pin is accommodated in the resin casing except for a portion, which connects to the outer circuit, and
wherein the resin casing is inserted in the hollow portion of the housing so that the housing and the resin casing are integrated each other.

17. The sensor according to claim 16,
wherein the terminal pin and the housing are molded with the resin casing by insert molding.

18. The sensor according to claim 16,
wherein the hollow portion of the housing includes an inner wall having an uneven portion for increasing bonding strength between the resin casing and the housing, and
wherein the terminal pin includes a hook portion for hooking the terminal pin to the resin casing so that the terminal pin is prevented from being removed from the resin casing, the hook portion being molded with the resin casing.

19. The sensor according to claim 18,

wherein the hollow portion of the housing has a cylindrical shape with a center axis, and

wherein the uneven portion of the hollow portion is asymmetric in relation to the center axis of the hollow portion.

20. A method of manufacturing a sensor, which includes a metallic housing having a hollow portion, a metallic terminal pin for connecting an outer circuit outside the sensor, a sensing element connected to the terminal pin for sensing physical quantity, and a resin casing, the method comprising the steps of:

inserting the terminal pin into the hollow portion of the housing;

setting the housing with the terminal pin in a die after the step of inserting the terminal pin into the hollow portion; and

casting resin material into the die so that the resin casing is formed such that the housing and the terminal pin are molded with the resin casing.

21. The method according to claim 20,

wherein, in the step of casting, the terminal pin is accommodated in the resin casing except for a portion, which connects to the outer circuit.

22. The method according to claim 20, further comprising the step of:

forming an uneven portion on an inner wall of the hollow portion so as to increase bonding strength between the resin casing

and the housing.

23. The method according to claim 22,
wherein the hollow portion of the housing has a cylindrical
shape with a center axis, and

wherein the uneven portion of the hollow portion is asymmetric
in relation to the center axis of the hollow portion.

24. The method according to claim 22,
wherein the uneven portion has a screw shape.

25. The method according to claim 22,
wherein the uneven portion has a wrinkle shape.

26. The method according to claim 22,
wherein the uneven portion is a groove disposed on the inner
wall of the hollow portion.

27. The method according to claim 22,
wherein the uneven portion is a through hole penetrating the
inner wall of the hollow portion.

28. The method according to claim 26, further comprising the
step of:

forming a resin introduction port in the housing,
wherein the resin introduction port is reached to the groove
so that the resin material is introduced into the groove through

the resin introduction port in the step of casting.

29. The method according to claim 20, further comprising the step of:

forming a hook portion in a predetermined part of the terminal pin so as to hook the terminal pin to the resin casing, the hook portion being molded with the resin casing in the step of casting.

30. The method according to claim 29,

wherein the hook portion of the terminal pin is a hole penetrating the terminal pin.

31. The method according to claim 29, further comprising the step of:

forming the terminal pin into a non-linear shape, which deviates from a center axis of the terminal pin,

wherein the non-linear shape of the terminal pin provides the hook portion of the terminal pin.

32. The method according to claim 29, further comprising the step of:

forming a part of the terminal pin into a taper shape, which expands toward one end of the terminal pin,

wherein the taper shape of the terminal pin provides the hook portion of the terminal pin.

33. The method according to claim 29, further comprising the

step of:

roughing a surface of the terminal pin,
wherein the surface of the terminal pin provides the hook
portion of the terminal pin.